

DETERMINANTS OF SMARTPHONES LEARNING ADOPTION IN TARABA STATE UNIVERSITY INSTITUTE FOR DISTANT EDUCATION AND LIFE LONG LEARNING: AN EMPIRICAL ANALYSIS

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Abstract: The study investigates how learning using smartphones is influenced by perceived usefulness and perceived ease of use in Taraba State University, Institute for Distance Education and Life-long Learning (IDELL) student. The study aims to investigate students' motivations affecting the adoption of smartphones among long distanced university students using the Technology Acceptance Model (TAM). Two research questions were raised. We employed the survey method for this study. Qualitative data collection techniques were utilised. Students were selected using a simple random sampling technique. Data were obtained using a structured questionnaire. Collected data from the questionnaire were analysed using frequency distribution. Findings indicate that Perceived Usefulness (PU) expressively influenced the Behavioural Intention to Use (BIU) a smartphone. Secondly, Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) positively influence an attitude toward the use of smartphones at the Taraba State University IDELL. From the findings, recommendations were proffered. The study not only provides valuable information about students' intention to utilize smartphones for learning but also enriches the current literature in Taraba State. Reviewing the current literature, it can be seen that this is the first study on this subject that specifically focuses on the application of smartphones by students of Taraba State University.

Keywords: Technology Acceptance Model, Perceived Ease of Use, Perceived Usefulness, Smartphones, Information Technology, Learning, Taraba State University, Jalingo, Nigeria.

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INTRODUCTION

The advent of Information Technology today affects almost all facets of human endeavour. The education sector, particularly the tertiary institutions, has been greatly influenced. Information Technology uses many gadgets including projectors, computers, and social media such as WhatsApp, Facebook, etc. These Information Technology (IT) facilities are being employed for teaching and learning. Smartphones, as IT gadgets have become essential in our day to day affairs. Because of its accessibility and portability, it is also being used as one of the Information Technology facilities for teaching and learning. According to Online Cambridge Dictionary (n.d.), smartphone is a mobile phone that can be used as a small computer; which also can be connected to the internet. This is possible because of the highly advanced features embedded in it. Typical smartphones possess high-resolution touch screen display. The features of a smartphone make it possible to access the internet and do so much online just like any other portable laptop could do. Not so many people could have access to a laptop, but many students have access to smartphones, since its perceived primary essence is to make calls and send text messages, which made it a readily available tool to be utilised for learning with its added features which made it

smart.

A survey carried out in the middle of the corona pandemic indicated high use of smartphones for learning in Nigeria and the implications. Practical implication revealed that smartphones enhance learning even outside the classroom and it has the capacity to change students' concepts about studying and researching with modern technology facilities. There is evidence that the use of smartphones impacted the academic pursuit of undergraduates in Nigeria. This is possible because smartphones enable faster access to information, promote information sharing and create better fora for collaboration among undergraduates, within and outside the country Madumere, Ekwelem, and Anike, (2020).

This trend has been there since 2016, as the study indicated that smartphone devices are used by the students to exchange education-related information: softcopy materials, surf the internet for materials, school library catalogues for academic materials hold collaborative discussions with mates among others Shonola, Joy, Oyelere and Suhonen, (2016).

In a most recent discovery, the narration is almost the same; that the use of smartphones is to have quick access to information among others. These days, undergraduates prefer using smartphones to access reading materials from the library. This saves time with respect to the period visiting the library and the stress involved Telia, Olawuyi, and Durodolu, (2021). Having said all these, it is clear that the value attached to the use of smartphones by students as far as their academic pursuit is concerned can never be over emphasised. Smartphones are gradually becoming tools in the teaching and learning world which is so eminent and so indispensable. They are more portable and easier than laptops.

With all the benefits accruing to students, smartphones are seen as a powerful companion in their academic pursuits. Nevertheless, there are undesirable effects of smartphones usage among undergraduates. Notably among such is that smartphones could serve as a distraction to their studies when not used carefully. In response to such, there could be a mechanism put in place by the institution to check those excesses and prevent abuse of smartphone usage (2021).

The research aims to find out what would motivate students to adopt and use smartphones for learning. Smartphones have been adopted for learning in many tertiary institutions across the globe. Egielewa Studies have been carried out to determine how well such technologies are faring in schools, their usage, effect and challenges in teaching and learning. Among such studies carried out, there is an indication that smartphone usage has great value and enormous advantages. The objective of this work is to examine IDELL undergraduates' perceived ease of use of a smartphone in learning and to also determine the perceived usefulness of a smartphone in learning. This will help students learn faster and have a good means of having access to information, even information far away from their reach through the use of smartphones.

Knowing well that such research on intention to use and subsequently using technology cannot be generalised. This is because constructs that may be favourable in a region or geographical area may not be favourable in another location. This was the rationale behind the advocacy that this participation identifies future research paths relating to using m-learning technologies such as smartphones, Butler, Camilleri, Creed and Zutshi (2021). Based on the aforementioned, the researchers have identified this research gap in the Taraba State University Distance learning programme and the need to study and find out the feasibility of the application of e-learning using the smartphone being acceptable by the students. This is because the programme was designed to cater for people that have a need for more education, but who do not have enough time to be enrolled in the regular programme due to other factors such as work schedule. It was designed to help them study from where they are, at their convenience and material were given to them for study at regular intervals. This, if

acceptable, will help create an online forum where students and lecturers meet to discuss and an avenue where learning material could reach students anytime, anywhere. This eventually makes life and study easy and simple. No wonder, the programme was named Institute for Distance Education and Life Long Learning

RESEARCH QUESTION

- How does perceived ease of use of a smartphone in learning among students in Taraba State University IDELL influence their learning?
- How does the perceived usefulness of a smartphone in learning among students in Taraba State University IDELL influence their learning?

LITERATURE REVIEW

The Concept of the Smartphone in Learning

Mobile-learning is a new paradigm for learning in the knowledge-based economic society; Liang, Wang, and Huang, (2021). The existence of this mobile learning, driven by IT is not only face-to-face among teachers and learners but can be done whenever and wherever the participants are. This could be made possible by the use the smartphones among other devices. One of the learning media using IT base is in the form of a smartphone device with the Android OS (Operating System). Presently, Operating System in Android is one of the most popular and is widely used. Butler, et al. (2021) added to the above opinion by saying that the use of smartphones to involve with m-learning applications could be at workplaces, at home, or anywhere. The idea of mobile learning via the use of smartphones is actually taken advantage of technology in order to meet the need of persons who are in need of education, but the situation could not make it possible. The presentation of smartphones aims to create an enabling forum where knowledge is disseminated just the way people use smartphones to communicate. If people could use smartphones with features that are suitable to communicate information and also send files and resources; multitasking per time, then teaching and learning could also take place using these devices.

This work identified the contextual factors like the individual learning styles, their motivation, integration with other learning approaches, time, cost and accessibility, among others. With specific interest in their motivation, the question is, what motivates them to accept, adopt and eventually use the technology for learning. This was what brought the factors of usefulness and the ease of use of any technology Butler et al. (2021). These two constructs have the capacity to determine their motivation. The question now again is what theorem could drive these findings?

Smartphones Usage in Distance Education

It is already becoming true that our sophisticated laptops could be replaced by our smartphones to do even more than the laptops could do. This became evident as was observed that all the students taking a particular course have Smartphones which they already use for educational purposes like note taking and googling. These necessitated the delivery of a distance education course by the use of Smartphones, assessment and evaluation Tuncay, (2016). Morphetou, (2014) opined that we are in a generation where IT is constantly evolving, providing students with more suitable ways of doing things, including learning, with the use of a smartphone which is extremely very fast. This innovation has become a trendy necessity, always providing access to the internet and allowing new ways of learning and teaching. This empirical study revealed and supports the view that more and more students now use their smartphones for educational purposes and often

replace the use of their laptops as was also opined by Tuncay, (2016).

It was further advanced that the tertiary education sector has seen a far-reaching change owing to new advanced technologies such as smartphones. By this, tertiary education needs to create a foundation powered by information communication technologies (ICT) where mobile applications like smartphones could extend opportunities for learning so as to meet possible requirements of the ever-changing job market. It was proven beyond a reasonable extent that research carried out in various contexts have discovered the radical change occasioned by the use of mobile applications - smartphones- which helps students to develop various skills as they utilize the digital environment. The study was encouraging, as it sheds light on specifying the vital variables and procedures for enhancing the role of mobile learning as a part of the electronic education for the private education sector in Iraq Al-Mashhadani, and Al-Rawe, (2018).

Students studying remotely need access to materials online, they need online communication tools. To these, further learning refers not just to studying at home and/or in their places of working, etc. It refers to studies for persons in different works of life, such as businessmen who are always on a journey to meet up with one business meeting or the other. One of these ICT tools being employed easily is the smartphone, which provides access to voice and video services Fojtik, and Habiballa, (2006).

The focus of mobile learning according to Arthur-Nyarko, and Kariuki, (2019) is the creation of a learning environment which is interactive through the use of the Internet which is beneficial to long distant education. It was in that background that the authors' recommendation requires the government to provide affordable ICT devices to distance educations. In addition, Internet service providers should provide reliable, affordable and accessible service to distant education students.

Students' Perceived Ease of Use of Smartphones in Learning Activities

The use of e-portfolios has been severely improved students' learning. Both Perceived Ease of Use and Perceived Usefulness show students' Behavioural Intention to Use e-portfolio Abdullah, Ward and Ahmed, (2016). Again, mobile devices equipped with Internet applications have dramatically increased the ease with which information is accessed by college students in language learning. Analyses showed that perceived usefulness, perceived ease of use among others accounted for over 70% of the variance explained in behavioural intentions to use mobile English vocabulary learning resources Chung, Chen, and Kuo, (2015). Investigating the factors which could influence Mobile Application usage by the students at Prince Sattam bin Abdulaziz University (PSAU) it was found that a significantly positive association of the perceived ease-to-use with perceived usefulness, significantly positive association of the perceived ease-to-use and the perceived usefulness with the attitude toward the usage of the PSAU's mobile application, a significantly positive association of the perceived usefulness with the behavioural intention toward the usage of the PSAU's mobile application, a significantly positive association of the student's attitude toward the usage of the PSAU's mobile application with the behavioural intention of using the application, and a significantly positive association of the behavioural intention with the actual usage of the PSAU's mobile application Ljaaidi et al. (2020).

It is clear from what is obtainable in those institutions above according to Abdullah, et al (2016), Chung, Chen, et al. (2015), and Ljaaidi, et al (2020) that perceived ease of use has the tendency to influence student intention to accept technology and eventually using them for their benefit.

Perceived Usefulness of Smartphone in Students' Academic Achievement

Massive Open Online Courses (MOOC) plays important roles in the current e-learning initiative and has become widely popular in many universities. Daneji, Ayub, and Khambari, (2019) opined that Perceived usefulness has significant effects on student's intention to use MOOC. The works by Mislinawati, and Nurmasyitah, (2018) is in tune with the opinion of Daneji, et al. (2019) who stated that the students perceived the web-based modules to be useful in improving their understanding, independence, self-discipline, motivation to learn, and interactions with each other and with the teacher. The students also agreed that the e-learning web-based module was easy to use. This study implies that the inclusion of technology in education at the university is beneficial Vitoria, Mislinawati, and Nurmasyitah, (2018).

The adoption of mobile learning improves students' performance through the use of various applications (apps), allowing students to take control of their learning experience. Madlala, Civil charranand Singh, (2020) examined the present use of smartphone apps for learning purposes, for undergraduate students at the University of KwaZulu-Natal (UKZN), Pietermaritzburg Campus. The results showed that undergraduate students most times use smartphone apps for learning activities. Perceived usefulness has a higher (positive) impact on attitude when compared with the impact of perceived ease of use.

Human beings are said to be rational, as when one perceived a thing is good for his or her benefits, they always go for it. From the opinions of the researchers mentioned that investigation on perceived usefulness of smartphones in students' academic achievements, it is obvious that perceived usefulness of smartphones have the tendency to influence students' intention to accept technology and eventually use them to positively impact their studies and research. On the contrary, the works of Al-Emran, Arpaci, and Salloum, (2020) recently is not in agreement with the opinion that perceived usefulness positively influence students to accept and eventually use a technology. They stated that a perceived usefulness index in the study was seen to be insignificant determinants to continuous intention to use mobile learning devices.

Before we conclude, it is essential to state here clearly that the opinion of lecturers or teachers is also vital as they drive the whole process. As positive as the students' disposition might be over this matter, lecturers must be at the forefront and also well positioned to willingly key into this effectively and efficiently. A study examined the lecturers' perception on incorporating mobile devices for teaching undergraduates; sampling lecturers from four Universities in Kwara State which are Al-hikmah University, Kwara State University, Landmark University and University of Ilorin. The results showed that lecturers view mobile devices as easy to use for teaching; showing a Grand Mean of (2.47). Hence, lecturers are encouraged development themselves on the ICT subject by attending training, conferences and other capacity building workshops so as to acquire more skills on the use of Mobile Devices and other ICT tools for teaching; Abbdulrahmanand Soetan, (2018).

Based on the above, we can say that smartphones are becoming fascinating learning tools used to improve teaching and learning in distance education. Using smartphones guarantees flexible delivery of courses and makes it possible for students and other learners to access online learning platforms, access course resources and interact digitally. This was the case of the findings at the University of Ghana where it was discovered using smartphones achieved remarkable results among the distance learning students as far as the academic pursuit is concerned Darko-Adjei, (2019).

We are of the opinion that when both teachers and students are influenced to this extent with little variation in one region to another, we could see clearly that perceived ease of use and perceived usefulness is very vital in evaluating the

intention to use technology and subsequently accepting and actually using it for learning.

THEORETICAL FRAMEWORK

Technological Acceptance Model (TAM)

The Technological Acceptance Model (TAM) has Actual System Use (ASU) as the key variable. According to the author, ASU is an individual's practical usage of a particular system (e.g. ICT in Teaching and Learning). ASU is functionally dependent on Behavioural Intention to Use (BIU) a technology, which is the extent to which a person has cultivated conscious plans to perform or not to perform some future behaviour. BIU is in turn, functionally dependent on both Attitude Toward Using (ATU) and perceived usefulness (PU). ATU reflect one's feeling on certain definite behavior as PU is the extent of belief that utilizing a certain system would improve performance. PU could be functionally dependent on Perceived Ease of Use (PEU), which the author defined as the extent of belief that using an ICT in teaching and learning would be free from effort. The theory further states that PU and PEU are influenced by external variables such as training. Based on the above case, the proponents of TAM state that ASU is functionally dependent on PU and PEU. They argue that if users find ICT in teaching and learning useful and easy to use then that will motivate a positive attitude toward using it (Luhamy, Bakkabulindi, and Muyinda, 2017).

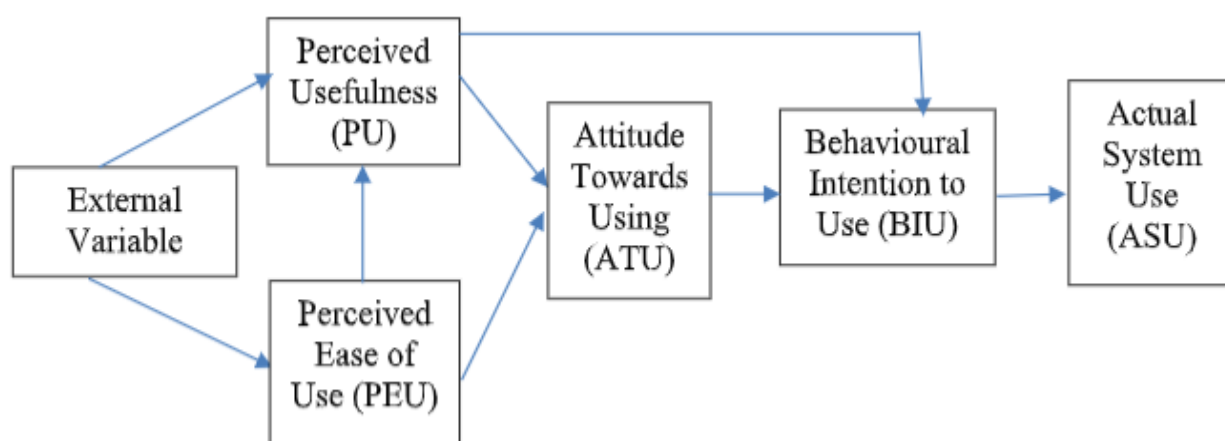


Figure 1.1: Technological Acceptance Model (TAM) (Source: Luhamyet al.,2017; p 25)

Technology Acceptance Model had indeed been very popular for explaining and predicting system use and most of the studies reviewed had focused only on voluntary environments, which is suitable for school voluntary settings. Furthermore, several studies on the TAM had made use of students as participants which cannot be generalised (Luhamyet al, 2017). TAM has better constructs than TRA and TPB and has the ability to predict system use. This is asserted because TAM has attitude towards using technology, behavioural intention to use technology and then actual system use. These are better constructs that could predict individual eventual acceptance, adoption and subsequent use of a technology.

The model has two (2) constructs namely perceived usefulness and perceived ease of use. For the sake of this study, the researchers want to concentrate only on the two constructs. So, because of that, this study shall adopt the diagram in figure 1.2 as a study model.

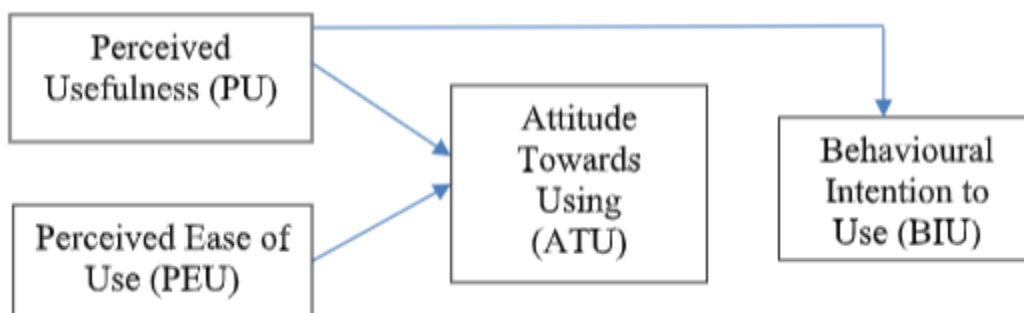


Figure 1.2: Technological Acceptance Model (TAM) for the Study

METHODOLOGY

This study adopted the survey method. Questionnaire was used to collect data. Students from the IDELL, Taraba State University were our sole target population for the study. This is because the programme is a newly enrolled one and we needed to investigate on how best to help it yield more results. We set out to find out how technology could help and how best this could be achieved, to know how the students could be influenced. So, it is important to know their learning activities can be impacted by the use of smartphones. The population for this study comprised of all the 100 level students from IDELL. The total population in 100 level was 51. Total enumeration was used and 62.8% responded to the questionnaire.

MAJOR FINDINGS

Perceived Ease of use of a Smartphone in Learning Activities

S/N		Strongly Agreed (%)	Agreed (%)	Undecided (%)	Disagreed (%)	Strongly Disagreed (%)
1	I find it easy to use smartphones for reading.	16 (50.0)	4 (12.5)	2 (6.3)	1 (3.1)	9 (28.1)
2	Using smartphone for learning does not require any special computer literacy skills	5 (18.5)	12 (44.4)	2 (7.4)	2 (7.4)	6 (22.2)
3	I find it easy to use smartphones for retrieval of materials	14 (48.3)	5 (17.2)	1 (3.4)	0 (0.0)	9 (31.0)
4	Smartphone interfaces are user-friendly and flexible to use	9 (30.0)	9 (30.0)	4 (13.3)	4 (13.3)	4 (13.3)

From Table 1.1, 20 (62.5%) of the respondents agreed that they find it easy to use smartphones for reading, 2 (6.3) were undecided and 10 (31.2%) disagreed. When asked if using a smartphone for learning does not require any special computer literacy skills, 17 (62.9%) agreed, 2 (7.4%) of them were undecided while 8 (29%) disagreed. Also, when respondents were asked if they would find it easy to use the smartphone for retrieving materials, 19 (65.5%) of the respondents agreed, 1 (3.4%) were undecided while 9 (31.0%) disagreed. Again, 18 (60.0%) of the respondents agreed to the fact that smartphone interfaces are user-friendly and flexible to use, 4 (13.3%) were undecided while 8 (16.6%) disagreed.

Based on the findings in Table 1.1, it is clearly evident that the use of smartphones will perform remarkable good among students in the IDELL programme of Taraba State University and their academic quest. This could be seen by a very high rate of responses agreeing to the fact that it would be easy and helpful when we use the technology for learning.

Perceived Usefulness of a Smartphone in Learning Activities

Table 1.2: Perceived Usefulness of Smartphones

S/N		Strongly Agreed (%)	Agreed (%)	Undecided (%)	Disagreed (%)	Strongly Disagreed (%)
2	Smartphones provide me with quick access to information online.	15 (55.6)	8 (29.6)	2 (7.4)	0 (0.0)	2 (7.4)
3	Using smartphones for learning enables me to gain extra skills and experiences outside the classroom.	14 (45.3)	12 (38.7)	0 (0.0)	0 (0.0)	5 (16.1)
6	Smartphones enable me to record lectures delivered by my tutors.	14 (46.7)	11 (36.7)	2 (6.7)	0 (0.0)	3 (10.0)
8	I can easily access my e-mail using a smartphone.	17 (56.7)	9 (30.0)	1 (3.3)	1 (3.3)	2 (6.7)
11	Smartphones promotes online group discussion	14 (48.3)	8 (27.6)	2 (6.9)	1 (3.4)	4 (13.8)
12	Smartphones enable me to use social media platforms for group learning activities.	8 (61.5)	3 (23.1)	0 (0.0)	2 (15.4)	0 (0.0)

From Table 1.2, 23 (85.6%) of the respondents agreed that smartphones provide them with quick access to information online, 2 (7.4) were undecided and 2 (7.4%) disagreed. When asked if using the smartphone for learning enables them to gain extra skills and experiences outside the classroom 26 (84.0%) agreed, none was undecided while 5 (16.1%) disagree. Also, when respondents were asked if smartphones enable them to record lectures delivered by their tutors, 25 (83.4%) of the respondents agreed, 2 (6.7%) were undecided while 3 (10.0%) disagreed. Again, 26 (86.7%) of the respondents agreed to the fact that they can easily access their e-mail using smartphones, 1 (3.3%) undecided while 3 (10.0%) disagreed. Smartphones promote online group discussion: 22 (75.9%) agreed to that opinion, 2 (6.9%) were undecided while 5 (17.2%) of the respondents disagreed. The smartphone enables me to use social media platform for class activities, 11 (84.6%) of the respondents agreed to that while the remaining 2 (15.4%) of them disagreed.

Based on the finding in Table 1.2, it is clearly evident that the use of smartphones will perform remarkable good among students in the IDELL distance learning among students of the Taraba State University and their academic quest. We made this claim based on the fact that a good number of the respondents truly agreed to the fact that smartphones could be of help to them if used for learning.

DISCUSSION

The findings of the research are discussed in the succeeding paragraph.

The study revealed that perceived ease of use of smartphones will help their learning. This was evident as the majority of the respondents expressed that the state of ease of use of smartphones will encourage their positive behavioural intention to use smartphones for learning. This view supports the expression of Chung, Chen, and Kuo, (2015) where they

affirmed that Mobile devices with Internet applications have increased access sources of information. Recently, Ljaaiddi, et al, (2020) in an investigation into factors influencing the usage of PSAU Mobile Application by the students at Prince Sattam bin Abdulaziz University (PSAU) indicated positive associations of the perceived ease-to-use with the attitude toward the usage of the PSAU's mobile application to be significant. This will increase student collaboration, increase students' zeal towards learning, participation and engagement.

Secondly, the study revealed that the perceived usefulness of smartphones will help their learning. This was evident as the majority of the respondents expressed that the perceived usefulness of smartphones will encourage attitude towards using smartphones for learning. This view supports the expression of Vitoria, et al (2018) as they stated that students viewed e-learning (web-based modules) to be beneficial in improving their comprehension, independence, motivation among others to learn and interact with others. This study implies that the inclusion of technology in education at the university is beneficial. Recently, Ljaaiddi, et al, (2020) in an investigation into factors influencing the usage of Mobile Application by the students at Prince Sattam bin Abdulaziz University indicated significantly positive associations of the perceived usefulness with the attitude toward the usage of the mobile application. Their findings indicated that usage of smartphones for learning in institutions of learning has increased student and lecturer collaboration, increased students' zeal towards learning, participation and engagement, facilitative and authentic learning and reflective practice, as well as fostering learning communities.

Consequently, perceived usefulness and perceived ease of use have great influence in determining the intention towards using a technology such as smartphones in learning. This was again emphasized by Salloum, (2018) who opined that perceived usefulness and perceived ease of use have led to an increase in the students' intention to use e-learning systems.

Finally, the study revealed that the perceived usefulness of the use of smartphones will help their learning since they discovered that the technology is of eminent benefit when used in learning. This was evident as the majority of the respondents expressed that the perceived usefulness of smartphones will influence their behavioural intention to use smartphones for learning. This view supports the expression of Ljaaiddi, et al, (2020) where they stated that there was a significantly positive association of the perceived usefulness with the behavioural intention toward the usage of the PSAU's mobile application.

CONCLUSIONS

The proliferation of IT facilities such as the smartphone in our societies is a welcomed development, particularly in the world of knowledge. The application of smartphones for communication helps in communicating with people far and near. The education sector such as the University is taking advantage of this and with much evidence from other Universities on how vital is the application of smartphones in teaching and learning. From the outcome of this investigation, it is revealed that the distance learning students of TSU would find it easy to use a smartphone in their academic activities which would, in turn, enhance their perceived usefulness of a smartphone for learning activities. Just as other institutions of higher learning are taking advantage of ICT in teaching and learning, even though this is not obtainable for now, this empirical finding indicates a positive outcome and high intention to use smartphones for learning by the students. The study showed the positives of the use of smartphones to learning activities by the students like in areas of sharing and accessing lecture materials online, easy communication with colleagues and course tutors. That students are able to carry the phones with them anywhere and anytime due to its portability is an advantage over the laptop.

RECOMMENDATION

For students who cannot afford a smartphone, we recommend that the government should make provision whereby smartphones are given free or upon payment of a small amount affordable by the students as a token; Internet services should be provided free to students throughout the nation, by governments at all levels, to all students, especially for those undergoing distance learning.

CONTRIBUTIONS TO KNOWLEDGE

This study has been able to contribute to the existing body of knowledge in the area of mobile learning using smartphones with this empirical evidence that perceived ease of use and perceived usefulness influence learning in Taraba State University IDELL, Jalingo, Taraba State, Nigeria. The study can be used for further related studies by researchers, thereby adding to the literature.

FURTHER RESEARCH

The research used only a quantitative approach. We, therefore, suggest that future research should use mix approach where quantitative and qualitative methods would be employed.

The research was carried out on students' attitudes towards using smartphones and behavioural intention to use smartphones for learning in the university. Further research should investigate the lecturers' attitude towards using smartphones and behavioural intention to use smartphones for teaching in the university.

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